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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,654

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EXAMINER

WEDDLE, ALEXANDER MARION

ART UNIT

PAPER NUMBER

1792

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/579,654	<b>Applicant(s)</b> MEREDITH ET AL.	
	<b>Examiner</b> ALEXANDER WEDDLE	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 July 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 35-63 is/are pending in the application.
- 4a) Of the above claim(s) 58,60 and 61 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 35-63 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/18/2006, 08/23/2007, 11/14/2008, 12/18/2008</u> .          | 6) <input type="checkbox"/> Other: _____                          |



**DETAILED ACTION**

***Election/Restrictions***

1. The restriction requirement of December 22, 2008 with respect to Groups I through III, the restriction requirement has been reconsidered and withdrawn.
2. With respect to the election of species, Claims 58 and 60-61 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on January 22, 2009.
3. Applicant's election with traverse of Claim 26 (new Claim 59) in the reply filed on January 22, 2009 is acknowledged. The traversal is on the ground(s) that the coating is formed by a common method. This is not found persuasive because although there is a common feature, the feature - a silica precursor formulation - is not a special technical feature (see, for example, Tanaka et al. (US 6,291,697), and therefore the claims lack unity of invention.

The election is still deemed proper and is therefore made FINAL.

To Summarize:

Claims 35-62 are currently pending.

Claims 58, 60, and 61 are withdrawn from consideration.

Claims 35-57, 59, and 62-63 are currently examined on the merits.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 38, 47, 59, 62, and 63 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 38 and 63 are rejected as vague, because it is unclear whether the MS-51 may comprise 100% silicic acid tetramethyl ester homopolymer by volume, thus the other ingredients of the mixture may not be present due to the recitation <3%, which reads on 0%.

Claim 47 is rejected as depending from cancelled Claim 1. However, Applicant has expressly communicated his intention to Examiner to substitute the new claims for the cancelled claims in order to clarify the record; therefore, Examiner understands new Claim 47 to depend from new Claim 35.

Claim 59 is rejected as indefinite, because the transitional phrase "comprised by" in this context makes it impossible to ascertain the metes and bounds of this claim.

Claim 62 is rejected as indefinite, because it is unclear whether there is a contradiction between the feature of a closed environment (excluding everything except the coated substrate and solvent environment) and an apparently open environment (open to the introduction of ammonia vapor and water vapor). Examiner will consider that any source of ammonia and water vapor, including from the coating itself, will meet the requirement of introducing water vapor to the solvent environment.

***Claim Rejections - 35 USC § 102/103***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 52-57 and 59 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Floch et al. (US 5,698,266).

Floch et al. (US'266) teach a crosslinked silica film/ coating with a refractive index between 1.1 and 1.56 made by a similar process (col. 4, lines 10-45; col. 6, lines 61-64; col.8, lines 28-32). The film with an identical or obviously similar structure would inherently or be reasonably expected to result in a film/ coating with the recited properties. In spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. It is well settled that when the prior art discloses a product which

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reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable.

Because of the nature of product-by-process claims the Examiner cannot ordinarily focus on the precise difference between the claimed product and the disclosed product. It is then Applicants' burden to prove that an unobvious difference exists, consult *In re Marosi*, 218 USPQ 289,292-293 (CAFC 1983).

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 35-37, 42-51, and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Floch et al. (US 5,698,266).

14. Regarding Claims 35-37 and 63, Floch et al. (US'266) teach a method of forming a silica film coated on a substrate, comprising the steps of producing a silica precursor formulation by adding a silicon alkoxide, such as silicic acid tetramethyl ester (also known as tetramethyl orthosilicate and tetramethoxysilane) to a solvent, such as a basic alcoholic medium; coating a substrate with the silica precursor formulation; and curing the silica precursor formulation onto the substrate in a vaporous ammoniacal environment (col. 3, line 65 to col. 4, line 7; col. 4, lines 10-60). US'266 teaches that the silica sol may be obtained by hydrolysis of the precursor, which Examiner considers would inherently result in a homopolymer of the tetraalkyl orthosilicate (col. 4, lines 23-29). US'266 discloses one embodiment in which the sol is prepared by mixing absolute ethanol with the tetraethyl orthosilicate, such that a person of ordinary skill would expect that the formulation in this example would have a water content of no more than 5% by volume (col. 6, lines 40-43). It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the process of US'266 by substituting tetramethyl orthosilicate for the tetraethyl orthosilicate in the embodiment, because



US'266 teaches that such a substitution can be made with a reasonable expectation of success (col. 4, lines 23-30).

Further regarding Claim 62, US'266 is silent as to establishing an equilibrium between the solvent and the solvent environment. Equilibrium or steady state is a commonly known principle of chemical thermodynamics to provide predictable ratio of reactants and products. It would have been obvious to a person of ordinary skill in the art to apply known thermodynamic principles to bring the closed system to equilibrium in order to ensure a desired and predictable composition of a film with a reasonable expectation of success.

Regarding Claims 42-44, US'266 teaches that the coating may be performed by spin coating or dipping (col. 1, lines 39-41; col. 6, lines 53-55); the coating may be allowed to settle before curing (col. 6, lines 55-56); and the curing is carried out in a closed ammoniac environment (col. 6, line 67 to col. 7, line 5).

Further regarding Claims 35 and 62, and regarding Claims 45-46, in another embodiment, water is included in the formulation (Example 2, col. 7, lines 44-49), but US'266 is silent as to the exact composition of the formulation after the reactions and process steps have been carried out. It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the process of US'266 by adding some amount of water to accelerate hydrolysis reactions to form the sol within the spirit of the invention with a reasonable expectation of success. Furthermore, the amount of water in the formulation is a result-effective variable, because it was known in the art to affect the degree of crosslinking of silica particles and the overall thickness

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reduction of the coating (col. 5, line 63 to col. 6, line 4). It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the process of US'266 by determining the optimal amount of water as a result of routine optimization.

US'266 fails to expressly disclose a closed ammonia environment which contains water and alcohol. However, the person of ordinary skill would expect the atmosphere of the closed system to contain ammonia, water, and the same alcohol as used as the solvent in the formation of the silica precursor, because of the vapor pressure of the components.

Regarding claims 47-51, US'226 discloses that the composition of the silica precursor or sol gel, which includes the precursor and its solvent, affects the characteristics of the silica film, including its porosity (which, in turn, is known to affect the film's mechanical strength), and is thus a result-effective variable (col. 1, lines 46-63; col. 2, lines 1-9 and lines 13-23; col. 6, lines 61-64; col. 8, lines 29-33). It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the process of US'226 by optimizing the relative proportions of the components of the silica precursor to achieve the desired porosity as a result of routine optimization.

15. Claims 38-41, and 63 rejected under 35 U.S.C. 103(a) as being unpatentable over Floch et al. (US 5,698,266) as applied to claim 35 and 62 above, and further in view of Nambu et al. (US 6,316,572).

Regarding Claims 38 and 63, US'266 is silent as to MS-51. Nambu et al. (US'572) teach similar steps of adding MS-51 from ColCote, which apparently contains the recited components, to a solvent which may contain water and alcohol to obtain a

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coating with good weather resistance and appearance (Abstract; col. 17, lines 51-62). It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the process of US'266 by using MS-51 from ColCote as the source of silicic acid tetramethyl ester homopolymer and tetramethoxysilane to make the sol gel taught by US'266, because US'572 teaches that MS-51 is useful to form a curable silicate film of good appearance and weather resistance without the need of a leveling agent (Abstract).

Regarding Claims 39-41, US'266 discloses an embodiment in which the solvent is absolute alcohol and another embodiment in which the solvent is a mixture of alcohol and water and suggests that the specific ratio of components affects porosity and mechanical strength (col. 1, lines 46-63; col. 2, lines 1-9 and lines 13-23; col. 6, lines 61-64; col. 8, lines 29-33). US'572 apparently does not disclose the exact amount of water to be added to the formulation but discloses various ratios of components and teaches that different ratios of components in the formulation affect the curability, gellation, weatherability, and appearance of the resulting film (col. 9, lines 23-55; col. 11, lines 31-45; col. 16, lines 38-46; col. 17, line 63 to col. 18, line 17). It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the process of US'266 in view of US'572 by determining the optimal ratio of components as a result of routine optimization.

### ***Conclusion***

16. No claim is allowed.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER WEDDLE whose telephone number is (571) 270-5346. The examiner can normally be reached on Monday-Thursday, 7:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on (571)272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. W./

Examiner, Art Unit 1792

/Michael Kornakov/

Supervisory Patent Examiner, Art Unit 1792